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COMMITTEE ON PAPERS AND PUBLICATIONS:

J. F. GEISLER,
A. A. BRENEMAN, Editor.

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J. F. GEISLER, L. H. FRIEDBURG.

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The Committee on Papers and Publications respectfully call attention to the resolutions of the Society, requiring that papers be submitted to the Committee before being read.

Authors will be furnished, gratis, with 20 reprints of each article published in the Journal, *if application for the same be made when the article is sent.*

Members are requested to give notice of any change of address, or failure in the delivery of the Journal. All communications relating to the Journal should be addressed to the Editor.

A. A. BRENEMAN, 97 Water St., New York.

REGULAR MEETING, FRIDAY, April 3d, 1891.

Vice-President, Prof. Breneman in the chair.

In the absence of the Recording Secretary, Mr. Geisler was appointed Secretary, *pro tem.*

The minutes of the previous meeting were read and approved.

The minutes of the meeting of the Board of Directors, of March 31st, were read and approved.

The following new members were elected: Herbert S. Bird, N. Y. Tartar Co., Brooklyn, N. Y.; H. R. Hall, care of Carbon Iron and P. Co., Parryville, Pa.; Charles E. Parker, East Orange, N. J.; Wm. J. Schieffelin, care of Scheffelin & Co., N. Y.; H. J. Seaman, care of Carbon Iron and P. Co., Parryville, Pa.; Thos. P. Wiltshire, care of N. Y. Tartar Co., Brooklyn, N. Y.

As associates: Dr. John B. Lynch, Coll. Physicians and Surgeons, N. Y.; A. P. Sharp, care of Sharp & Dohme, Baltimore, Md.

The following names were proposed for membership: C. S. Boynton, A. L. Kennedy, Geo. W. Riggs, G. W. Roberts, E. D. Williams.

For associate membership: A. O. Ingalls.

The reports of Committees being next in order, the chair announced the Committee on Investigation of Tests of Hardness of Waters, etc., the appointment of which was ordered by vote at the March meeting, as follows: A. R. Leeds, J. W. Mallet, C. A. Doremus, E. Waller, A. A. Breneman.

As Committee on Contributions to the Journal: Wm. McMurtrie, G. F. Barker, G. C. Caldwell, E. Waller, A. R. Leeds.

The following papers were then read:

"On Some Analyses of Coal," by Dr. C. E. Munsell.

"On the Effect on Butter of Feeding Cotton Seed Oil," by Prof. N. T. Lupton; read by the acting Secretary.

"On Acid Calcium Tartrate," by Dr. L. H. Friedburg.

"On Methyl Iodide," by Dr. L. H. Friedburg.

The meeting was then adjourned.

J. F. GEISLER,
Rec. Secretary *pro tem.*

THE EFFECT ON BUTTER FROM FEEDING ON COTTON SEED AND COTTON SEED MEAL.

By Prof. N. T. Lupton.

An investigation was undertaken a few months ago at the Alabama Experiment Station to determine the effect of cotton seed and cotton seed meal on the composition of the butter fat, especially on the volatile acids, the melting point, and the specific gravity of the butter produced.

Several chemists of late years have called attention to changes produced by the use of the feed stuffs mentioned, notably Prof. Harrington, of the Texas Experiment Station and Dr. Wiley, of the Department of Agriculture, Washington, D. C. This subject was thought to be of sufficient scientific and practical importance to justify an extended investigation. For this purpose, a herd of registered Jerseys was divided into two groups, one consisting of ten cattle and the other of a single cow. The cattle of the first group were fed for a preparatory period of ten days on the customary ration used at the station, excluding cotton seed meal and hulls, the single cow was fed on the same ration. At the end of the preparatory period, samples of milk and butter were taken for one week, on Monday, Wednesday and Friday, and carefully analyzed. The milk of the ten cattle composing the first group was mixed and churned as a whole, that of the single cow was kept separate and churned by itself. The first preparatory period was for ten days; after that, the experimental and preparatory periods extended over seven days each.

The daily rations for the different periods which represent the kind and quantity of food actually consumed, were as follows:

1st Period, preparatory and experimental.

Ground oats	5 lbs.
" corn	5 "
Bran	5 "
Nutritive Ratio	1:5.8.

2d Period.

Cotton seed meal	3 lbs.
Ground oats	4 "
Bran	5 "
Ensilage	11
Nutritive Ratio	1:3.75.

3d Period.

Cotton seed meal	4 lbs.
Cotton seed hulls	9 "
Ensilage	4½
Nutritive Ratio	1:5.08.

During the fourth period, the cattle were confined exclusively to raw cotton seed and cotton seed hulls; and during the fifth period to cooked cotton seed and cotton seed hulls. They were allowed as much as they would eat. The nutritive ratios mentioned above are calculated from analyses made of the feed stuffs in use at the station. In compounding the rations, the object was not so much to conform with strictness to the German standard as to bring the cows gradually under the influence of cotton seed, cotton seed meal, and hulls, without injury to their general health.

The results of the analysis of samples of milk and butter, taken immediately after each milking and churning, are given below. The first two tables give the composition of each sample of milk analyzed, also the volatile acids, melting point, and specific gravity of the butter from the same milk; the third table gives the average composition for each experimental period.

Composition of Jersey Milk for each day analyzed.						Butter from same Milk.			
Date.	Water.	Butter Fat.	Casein.	Sugar.	Ash.	Volatile Acids.	Melting Point.	Specific Grav. at 100° C.	Rations.
Group I.	Pr Ct.	Pr Ct.	Pr Ct.	Pr Ct.	Pr Ct.	Expressed in c. c. one-tenth normal alkali for 5 grms. of fat.	C°.		
									Period I.
Nov. 19...	85.76	5.53	3.95	3.96	0.80	30.0	35°.9	0.90257	5 lbs ground oats.
" 21...	84.95	5.20	4.05	5.09	0.81	29.6	35°.3	0.90311	5 lbs ground corn.
									5 lbs. bran.
									Period II.
									3 lbs cotton seed meal.
Dec. 1....	84.15	5.73	4.06	5.24	0.82	29.7	36°.0	0.90411	4 lbs ground oats.
" 3....	83.62	5.51	3.88	6.19	0.80	30.5	36°.3	0.90165	5 lbs. bran.
" 5....	84.26	5.16	3.90	5.98	0.80	31.4	36°.1	0.90265	11 lbs. ensilage.
									Period III.
									4 lbs. cotton seed meal.
" 15...	84.53	5.96	3.64	5.12	0.75	28.4	36°.6	0.90081	9 lbs. cotton seed hulls.
" 17...	83.35	6.07	3.60	6.03	0.75	26.9	37°.6	0.90194	4½ lbs. ensilage.
" 19...	84.71	5.79	3.57	5.19	0.74	27.1	38°.1	0.90306	
									Period IV.
Jan. 5....	84.27	6.41	3.58	5.01	0.73	22.0	43°.6	0.90021	Raw cotton seed
" 7....	84.59	6.11	3.34	5.22	0.74	21.9	43°.9	0.89721	Cotto.n seed hulls.
" 9.....	84.51	5.84	3.56	5.37	0.72	22.4	43°.4	0.89955	
									Period V.
									Cooked cotton seed.
" 19...	85.84	4.87	3.39	5.16	0.74	23.1	42°.7	0.90462	Cotton seed hulls.
" 21...	84.89	5.95	3.31	5.08	0.77	22.2	42°.3	0.90057	
" 23...	85.38	5.53	3.31	5.04	0.74	22.1	43°.0	0.90266	

Composition of Jersey Milk for each day analyzed.						Butter from the same Milk.			
Date.	Water.	Butter Fat.	Casein.	Sugar.	Ash.	Volatile Acids.	Melting Point.	Specific Grav. at 100° C.	Rations.
Group II.	Pr Ct.	Pr Ct.	Pr Ct.	Pr Ct.	Pr Ct.	Expressed in c. c. one-tenth normal alkali for 5 grms. of fat.	C°.		
									Period I.
Nov. 24..	85.53	4.67	3.84	5.23	0.73	31.4	35°.1	0.90188	5 lbs ground oats.
" 28..	84.03	5.93	3.93	5.30	0.81	31.5	33°.4	0.90458	5 lbs ground corn. 5 lbs. bran.
									Period II.
Dec. 8....	85.71	4.75	3.56	5.30	0.68	.....	.....	.....	3 lbs. C. S. meal 4 lbs ground oats.
" 10...	85.68	4.53	3 84	5.24	0.71	31.7	36°.5	0.90282	5 lbs. bran.
" 12...	85.63	3.94	3.66	6.02	0.75	30.6	36°.2	0.90022	11 lbs. ensilage.
									Period III.
" 22...	85.26	4.74	3.42	5.86	0.72	25.5	37°.5	0.90192	4 lbs. C. S. meal. 9 lbs. C. S. hulls.
Jan. 2....	84.31	5.85	3.69	5.42	0.73	25.4	41°.3	0.89798	4½ lbs. ensilage.
									Period IV.
" 12..	85.17	5.12	3.40	5.60	0.71	20.5	43°.5	0.89751	Raw cotton seed.
" 14...	85.10	4.76	3.47	5.98	0.69	19.2	41°.0	0.89929	Cotton seed hulls.
" 16...	85.54	4.80	3.34	5.64	0.68	21.4	43°.0	0.89882	
									Period V.
" 26...	86.21	4.87	3.13	5.09	0.70	22.0	43°.3	0.89775	Cooked cotton seed.
" 28...	86.00	4.88	3.12	5.28	0.72	22.1	43°.3	0.89994	Cotton seed hulls.
" 30...	85.39	6.00	3.18	4.72	0.71	21.7	44°.0	0.89803	

Average composition of Jersey Milk during each period.						Butter from same Milk.			
Period.	Water.	Butter Fat.	Casein.	Sugar.	Ash.	Volatile Acids.	Melting Point.	Specific Grav. at 100°C.	Rations.
Group I.									
I.	85.35	5.36	4.00	4.52	0.81	29.8	35°.6	0.90284	5 lbs. each ground oats, ground corn and bran.
II.	84.01	5.47	3.95	5.80	0.81	30.5	36°.1	0.90280	C. S. meal, 3 lbs.; ground oats, 4 lbs.; bran, 5 lbs.; ensilage, 11 lbs.
III.	84.20	5.91	3.60	5.45	0.75	27.5	37°.4	0.90194	C. S. meal, 4 lbs.; cotton seed hulls, 9 lbs.; ensilage, 4½ lbs.
IV.	84.46	6.12	3.49	5.20	0.73	22.1	43°.6	0.89899	Raw cotton seed meal and cotton seed hulls.
V.	85.37	5.45	3.36	5.09	0.75	22.5	42°.7	0.90262	Cooked cotton seed meal and cotton seed hulls.
Group II.									
I.	84.78	5.30	3.89	5.26	0.77	31.4	34°.2	0.90323	5 lbs. each ground oats, ground corn and bran.
II.	85.67	4.41	3.69	5.52	0.71	31.1	36°.3	0.90152	C. S. meal, 3 lbs.; ground oats, 4 lbs.; bran, 5 lbs.; ensilage.
III.	84.79	5.30	3.37	5.64	0.72	25.45	39°.4	0.89995	C. S. meal, 4 lbs.; cotton seed hulls, 9 lbs.; ensilage, 4½ lbs.
IV.	85.27	4.89	3.40	5.74	0.69	20.4	42°.5	0.89854	Raw cotton seed meal and cotton seed hulls.
V.	85.87	4.92	3.14	5.03	0.71	21.9	43.5	0.89857	Raw cotton seed and cotton seed hulls.

The following table, taken from a record carefully kept at the dairy, gives the aggregate amount of milk and butter produced by the first group, consisting of ten cows, for each experimental period of seven days:

	Pounds of milk.	Pounds of butter.	Pounds of milk for one pound of butter.
Period I.	1,414½	82	17.2+
" II.	1,275	85½	14.9+
" III.	975	91	10.7+
" IV.	896	75	11.9
" V.	716	58	12.3+

As will be observed there is a marked falling off in the quantity of milk and a corresponding increase in the amount of butter produced during the first three periods, as the cattle were getting more under the influence of cotton seed meal.

During the remaining periods the quantities of both milk and butter diminish, the ration being confined to cotton seed and cotton seed meal, without reference to having it well balanced as a milk ration.

The general effects of these valuable feed stuffs, when used in carefully prepared rations, will hereafter be investigated; at present we are concerned only, as previously stated, with their effects on the volatile acids, melting point and specific gravity of the butter fat produced under their influence. For these effects attention is called to the above tabular statements from which the following conclusion is drawn:

Feeding on cotton seed and cotton seed meal increases, in a marked degree the melting point of butter, the increase reaching in these experiments eight or nine degrees, and diminishes to a corresponding extent the volatile acids, while the specific gravity remains virtually the same.

The richness of cotton seed meal in albuminoids renders it of prime importance to mix it with one or more feed stuffs poor in this nitrogenous compound, such as ensilage, hay, or cotton seed hulls.

It may be stated in this connection that no change was observable in the color of the butter from feeding cotton seed and cotton seed meal. The samples, still in the laboratory, are all of a beautiful golden yellow.

It is proper to state that the analytical work in the above tables was done by Dr. J. T. Anderson, first assistant in the chemical laboratory.

AUBURN, ALA., March 27, 1891.

"SOME NOTES ON ELECTROLYTIC QUANTITATIVE SEPARATION OF METALS."

BY T. O'CONNOR SLOANE, PH. D.

It may seem somewhat presumptuous after Classen's classic work in electrolytic analysis, to offer any suggestions as to the conducting of this class of quantitative determinations. But there is one point in the work which it may safely be said has been to a certain extent neglected. This point is the influence of electromotive force, or of difference of potential upon the separations.

In Classen's work upon the subject the voltage of the circuit is duly considered, and an elaborate rheostat for regulating the voltage within somewhat crude limits ($\frac{1}{2}$ volt) is described. This is in one of the introductory chapters. The rheostat is for use with a 600 watt dynamo. But the author also mentions batteries and describes his method of conducting determinations with these sources of electromotive force. The current strength is then the standard, and it is determined by the volume of oxyhydrogen gas, which the current can liberate in a definite time. In other words, the amperage of the current alone receives direct attention. By using the same sized electrodes, the author states, the conditions are kept sensibly the same. Here we have an indirect recognition of the influence of electromotive force. But the attempted

maintenance of the most uniform conditions is a poor reliance. The conditions will inevitably vary and the temperature of the room and gradual change of the nature of the solution operated on will cause variations in resistance that will affect the difference of potential. To show how little regard is paid to voltage, we are directed in iron determinations to use two and sometimes three Bunsen cells. Any change in the number of cells in series would cause great variations in the voltage, in the case cited about 50%. If the cells were kept in parallel and any resistance, such as that of a voltameter, were in series with the decomposing apparatus, a great variation in voltage would even then ensue by changes in the number of cells.

The object of these notes is to plead for a greater recognition of the influence of difference of electric potential in analytical work. The facts of the case are these : For the decomposition of every solution a definite and absolutely fixed voltage is required. The strength of current affects only the condition of the deposit. Thus a current of any number of amperes might be passed through acidulated water without decomposing it until the voltage passed a fixed point when decomposition would at once begin. A single gravity cell, large or small (sulphate of copper-zinc-copper couple) cannot decompose water because its voltage is too low. The minutest bichromate cell will at once begin to decompose it because its voltage is high enough.

Again, the amperage of the current should not be broadly stated without reference to absolutely fixed conditions of electrodes. The proper way would be to state it as referred to unit area of cathode and anode. Probably the cathode reference would be all that is needed. As ordinarily put the cathode is supposed to be a platinum dish of more or less definite size, filled with a variable depth of fluid, and the electrolytic gas set free in one or more minutes is given. All this tells nothing.

It would seem obvious that, a definite and absolutely fixed difference of potential being required for the decomposition of each compound, the voltage could be made the basis for analytical work. It would be possible to effect successive separation of metals from the same solution by modifying the voltage, starting,

of course, with the lowest. How far the precipitation of mixed metals, so called alloys, would interfere with such attempts is not definitely recorded. It amounts to nothing to state, as is done, that a weaker current than is required for iron or some other metals, will precipitate copper. The strength of the current has nothing to do with it. It is the difference of potential that affects the result. The varying of such difference corresponding in a general way with the strength of the current, as the operations were conducted, has doubtless occasioned the confusion.

In stating the results of or giving directions for conducting electrolytic separations, two factors should always be stated. One is the difference of potential, the other the amperage per unit area of cathode. Then something definite would be known. It seems probably that by working on these lines, some exceedingly interesting results in the way of double decompositions as well as of separations, might be obtained.

Should any such result be obtained as the determining of a series of potential differences available for separations of metals from single solutions it would be highly interesting. The heat of combination of a vast number of compounds has been obtained and is readily reduced to volts, but such reduction is theoretical and does not accurately hold for all cases. The principal trouble would lie in the regulation of the voltage. But at the least there seems ground for research in the direction here suggested.

361 BROADWAY, New York.

SOME ANALYSES OF CARBON MINERALS.

By Charles E. Munsell, Ph. D.

The following analyses of fourteen specimens of Carbon Minerals, from the collection illustrating Economic Geology at the School of Mines, Columbia College, were made according to the methods described in Cairn's Quantitative Analysis, and have not previously been published.

The specimens were nearly all collected by Prof. J. S. Newberry, whose paper on The Origin and Relations of the Carbon Minerals (Annals of the New York Academy of Sciences, Vol. II., No. 9, 1882), describes the formation of these minerals.

	Water.	Carbon.	Hydrogen.	Sulphur.	Nitrogen.	Oxygen.	Ash.
Peats.							
Ravenna, Ohio. Surface	7.95	57.84	7.10	.20	.84	21.12	4.95
" " Bottom	12.60	41.81	6.95	6.26	2.24	16.48	13.66
Lignites.							
Kannarrah, Utah. Cretaceous	7.45	53.95	8.30	.90	.98	23.57	4.85
Cedar City, " "	2.39	59.55	6.68	1.22	.98	25.89	3.29
Canon City, Colorado	5.65	56.95	4.65	1.19	.28	27.66	3.62
Morrison, "	8.20	64.05	4.80	.51	.70	17.24	4.50
Fort Berthold, Dakota	8.00	57.20	5.22	1.88	.70	25.52	1.48
Carbon Station, Wyoming	7.35	63.65	4.60	.76	1.40	19.44	2.80
Point of Rocks, "	5.35	70.50	4.50	.98	1.12	12.35	5.20
Coking Coal.							
Crested Butte, Colorado	1.00	74.29	7.49	.61	1.40	9.17	6.04
Anthracites.							
Queen Charlotte's Island, British Columbia	1.90	75.95	6.03	.95	1.40	6.81	7.96
Crested Butte, Colorado	.72	82.50	5.15	.85	1.12	4.55	5.21
Albertite.							
Castle Valley, Utah	.67	71.30	7.96	.70	.28	18.05	1.04
Shale.							
Green River, Wyoming	2.40	35.35	6.41	1.29	.84	2.79	50.92

LABORATORY NOTES.

By Dr. L. H. Friedburg.

I.—ON ACID CALCIUM TARTRATE.

The best way for the purification of mother liquors of the tartaric acid manufacture is to transform the acid, after removal of most of the free sulphuric acid, into calcium acid tartrate.[1] It has appeared commendable to me to use the solution of calcium acid tartrate, obtained in this way, for the *manufacture* of the salt contained in it, which could then advantageously be used alone or mixed with cream of tartar for baking powders. Manufacturers would save labor and fuel in so doing.

II.—ON ALKYL IODIDES.

The attempt was made to prepare methyl iodide in a way different from the one in use which consists in treating iodine and red phosphorus with methyl alcohol. The methods applied were the following:

(*A*). A solution of iodine in methyl alkohol was treated with hydrogen sulphide until the deep brown color of the liquid has entirely disappeared. The presence of methyl iodide was proved by fractional distillation. Sulphur containing products of bad odor were obtained at the same time and the conditions for working these have yet to be found, before the method can be applied.

(*B*). A solution of iodine in methyl alcohol was treated with sulphur dioxide. Here also methyl iodide was formed in small quantity. The main product consisted of different ethers.

New York, April 3, 1891.

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[1] *Journ. Am. Chem. Soc.*; **4**, 295.

Abstracts of American Patents Relating to Chemistry.

(*From the U. S. Patent Office Gazette.*)

Patents issued March 31, 1891.

449,104.—Process of coloring and finishing fabrics. Victor G. Bloede, Baltimore, Md.

The fibre is impregnated with starch or a mixture of starch and coloring matter and then treating the impregnated fibre with a solution of caustic lime or other equivalent compound which has the power of rendering the starch insoluble.

449,152.—Artificial stone. Louis Enricht, New York, N. Y.

Prepared from magnesium oxide, calcium oxide, magnesium chloride, sodium silicate, and water.

449,214.—Manufacture of artifical stone. Louis Enricht, New York, N. Y.

A magnesia cement similar to the above.

449,271.—Filter for syrups and juices in sugar works. Karl Proks, Prague, Austria-Hungary.

449,292.—Ore concentrator. Frank B. Morse, Murphy's, Cal.

449,339.—Shoe blacking. George P. Tipton, Hot Springs, Ark.

Arkansas graphite (graphitic shale) is incorporated with the oils and acids of an ordinary shoe blacking.

449,356.—Manufacturing chains by electric welding process. Elihu Thomson, Lynn, Mass.

449,437.—Tanner's oil. William B. Davis, Newport, N. Y.

An oil mixture consisting of stearine, tallow, raw linseed oil, and oil of citronella.

449,454.—Process for degumming and preparing. Walter R. Wade, Brooklyn, N. Y.

Fibre is boiled in an alkaline solution of potash or soda containing saponine.

449,455.—Ditto.

The fiber is boiled in an alkaline solution containing quillain bark, or a decoction or extract thereof.

449,503.—Process of brewing malt liquors. Basil W. Valentine, Birmingham, Eng.

The unhopped wort, after it has left the mash-tun, is heated to a temperature of about 180° Farhenheit to coagulate certain nitrogenous substances, and then quickly cooling the wort to a temperature of 150° F., after which the wort is sprayed and filtered through the grain.

449,510.—Process of manufacturing cement. George Williams, Winnipeg, Canada.

Carbonate of lime and silicate of soda are treated by steam under pressure and to the resulting compound alumina and silex and a thin paste of chloride of calcium, unslaked lime and warm water are added, the mass molded into convenient forms, then burned to a white heat, after which the mass is ground to a fine condition.

449,520.—Benzo-rhodamine. Maurice Ceresole, Neuville, France.

A red dye stuff. Soluble in cold water, more soluble in hot water. Readily soluble in water containing a little hydrochloric acid, readily soluble in alcohol, the red solution showing the striking yellowish-orange fluorescence, insoluble in ether and benzine, soluble in conc. sulphuric acid with orange-yellow color, and in hydrochloric acid giving a scarlet red solution.

449,530.—Bengal light compound. Charles Gerhard, Jersey City, N. J.

A compound for Bengal lights consisting of copal, ether, alcohol, strontium, nitrate and potassium chlorate with or without shellac or varnish.

449,547.—Composition for use in the manufacture of steel. James Mackintire, Sheffield, England.

A compound consisting of calcium carbonate and phosphate, black oxide of manganese, tannic acid or tannin, vegetable root, animal charcoal or bone black and tar.

449,551.—Dihydroxynahpthalene. Eugene Mentha, Ludwigshafen-on-the-Rhine, Germany.

Dihydroxynaphthalene melts at 160°–161° C., is slightly soluble in cold water, readily soluble in hot water, alcohol, ether, fusel oil, slightly soluble in benzine and petroleum ether, and yields an intensely blue coloration with ferric chloride solution.

449,552.—Settling and amalgamating pan for machinery for extracting gold and other precious metals. William A. Merralls, Kansas City, Mo.

449,586.—Art of producing ground wood pulp. Edward F. Millard, Jackson, Mich.

449,603.—Apparatus for making extracts. Stephen C. Thrall, Elk Rapids, Mich.

449,610.—Magnetic separator. Richard R. Moffatt, New York.

449,619.—Artificial stone or cement. L. Enricht, New York, N. Y.

A magnesia cement.

449,629.—Black dye. Jakob Schmid, Basle, Switzerland.

A dark brown powder derived from monoalkylized derivatives of beta-naphthylamine and a diazo compound of the formula

$$C_{10}H_5\,(SO_3\,Na)_2(a){=}N{-}N{-}C_{10}H_6N{=}N\,Cl(a)$$

which is easily soluble in water, difficultly soluble in alcohol, insoluble in benzine. Its aqueous solution is not changed by the addition of caustic alkalies, but is precipitated by addition of mineral acids.

April 7th, 1891.

449,675.—Illuminated embossed paper and process of producing the same. Philipp Hake, Hoboken, N. J.

449,687.—Process of and apparatus for making explosives. Hiram S. Maxim, Crayford, England.

449,726.—Process of and apparatus for separating ores magnetically. Clinton M. Ball, Troy, N. Y.

449,737. } Paper building material. Silas H. Hamilton, Philadelphia,
449,738. } Pa.

449,741.—Composition for treating seeds. John Johann, Harrison, Wis.

To prevent the destruction of seeds by insects. The seeds are treated with a solution containing saltpeter and salt, with or without blue vitriol.

449,747.—Apparatus for extracting sugar from saccharine materials George E. Patrick, Ames, Iowa.

449,750.—Art of making ornaments, etc., from hair, and composition for use in the same. Margaret I. Waldron, St. Joseph, Mo.

449,758.—Process of collecting the aromatic and volatile substances from coffee. Nicholas L. Le Turcq des Rosiers, Etain, France.

449,783.—Process of making metallic composition. Elizabeth J. Rollings, Mobile, Ala.

Anti-friction alloys are made by melting the metallic charge and then combining therewith a powdered mixture of plumbago, alum and charcoal.

449,794.—Method of preparing flour. Eli H. Dunn, Elma, Iowa.

449,803.—Crucible for the manufacture of steel. George Nimmo, Allegheny, Pa.

449,809.—Apparatus for the manufacture of gas. Charles Telher, Paris, France.

449,813.—Apparatus for extracting gold or silver from ores. Joseph Cragg, Baltimore, Md.

449,814.—Lixiviation process of and apparatus for the extraction of gold or silver. Samuel W. Cragg, Baltimore, Md.

449,815.—Process of extracting gold or silver from ores. Joseph Cragg, Baltimore, Md.

449,836.—Method of electric welding. Elihu Thomson, Swampscott, Mass.

449,839.—Process of preparing pepsin. Joseph L. R. Webber, Detroit, Mich.

Animal's stomachs are macerated in acidulated water and to the resultant solution sulphurous acid is added, after which at a suitably high temperature the solution is precipitated and clarified by the addition of sodium sulphate. The precipitated pepsin is dissolved in dilute hydrochloric acid and the sodium sulphate removed by dialysis and crystallization.

449,850.—Coffee roaster. Olof Hammarström, Worcester, Mass.

449,853.—Device for drawing steam beer. Constant Harth. Willows, Cal.

449,874.—Manufacture of decorative relief material. Louis Enricht, New York, N. Y.

449,890.—Apparatus for electroplating small articles. Frederick W. Zingsem, New York, N. Y.

449,976.—Apparatus for lixiviating sugar. Carl Steffen, Vienna, Austria-Hungary.

449,998.—Process and apparatus for hardening hollow articles of steel. Henri A. Brustlein, Unieux, France.

450,013.—Ore concentrator. Walter J. Hammond and John Gordon, Rio de Janeiro, Brazil.

450,020.—Dyeing machine. Joseph Hussong, Camden, N. J.

450,037.—Black dye. Hermann Reisenberger, Höchst-on-the-Main, Germany.

A quinoline compound derived from amido-purpurine, which is a black basic dye or paste, soluble in soda lye with violet red color subliming on heating in small green needles, and, when heated quickly in a tube with twenty parts of zinc dust, converted into the anthraquinoline described by Graebe.

450,052.—Apparatus for burning gas tar or other liquid fuel. William Bliss and Enoch Bradbury, etc., Birmingham, Eng.

450,063.—Ore concentrating machinery. Calvin M. Fitch, Chicago, Ill.

450,099.—Method of producing light by incandescence. Otto B. Fahnehjelm, Stockholm, Sweden.

450,103.—Electrolytic apparatus. Ernest A. Le Suem, Ottawa, Canada.

450,104.—Electrolytic cell. Ernest A. Le Suem, Ottawa, Canada.

450,119.—Process of manufacturing imitation horse hair from palmetto. Constantine B. Warrand, Bluffton, S. C.

450,120.—Process of extracting palmetto fiber. Constantine B. Warrand, Bluffton, S. C.

450,121.—Process of and composition for tanning. Constantine B. Warrand, Bluffton, S. C.

The hides are subjected to a series of baths containing a compound extracted from the leaves of the saw palmetto (*sabal serrulata*).

450,123.—Incandescent light. Otto B. Fahnehjelm, Stockholm, Sweden.

450,522.—Fumigating compound. Charles F. Morris and Thomas Chenevat, Blencoe, Iowa.

A mixture consisting of sulphur, white sugar, charcoal, wood ashes, salt, and with or without saltpeter.

450,531.—Phosphatic fertilizer. Jacob Reese, Philadelphia, Pa.

Consists of muriate of potash and pulverized calcareous phosphatic slag.

450,534.—Apparatus for extracting hops. John Schneider, Cleveland, Ohio.

450,591.—Apparatus for making dope for explosives. John C. Schraeder, Dover, N. J.

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450,199.—Ice freezing machine. Charles C. Smith, Brooklyn, N. Y.

450,201.—Brick or tile machine. John C. Titus, New Bremen, Ohio.

450,232.—Boiler cleaning compound. Edw. J. Hoffman, Sioux City, Iowa.

A compound consisting of gum of japonica, oak bark, borax, calcined magnesia, carbonate of soda and water.

450,243.—Process of clarifying liquids. Carl Liesenberg, Halle-on-the-Saale, Germany.

The process consists in adding to the liquid to be clarified a solution containing a phosphate and sulphurous acid.

450,253.—Ammoniated phosphate. Jacob Reese, Pittsburg.

450,254.—Phosphatic fertilizer. Jacob Reese, Pittsburg.

450,255.—Phosphatic fertilizer. Jacob Reese, Pittsburg.

450,264.—Varnish. Edmond W. Todd, Newark, N. J.

A solvent consisting of a distillate of fusel oil, benzine and acetic acid.

450,280.—Ore concentrator. Louis W. Young, New York, N, Y.

450,287. } Art of making plaster casts. Louis Enricht, New York, N.Y.
450,288. }

450,304.—Art of making filaments for electric lighting. Silvanus F. Van Choate, Boston, Mass.

450,391.—Centrifugal butter extractor. Adolph Wahlin, Stockholm, Sweden.

450,404.—Preparing ozone water. Julius C. Ditrich, New York, N. Y.

Water containing a phosphite or hypophosphite is charged with ozone.

450,425.—Heat annunciator. Adolph Reinemann, New York. N. Y.

450,437.—Feed water purifier. Henry Warden, Philadelphia, Pa.

450,492.—Continuous automatic machine for the manufacture of starch. John A. Ostenberg, Des Moines, Iowa.

450,501.—Method of recovering vaporized solvents. James R. Whiting, NewYo rk, N. Y., and William A. Lawrence, Waterville, N. Y.

450,887.—Process of obtaining ecgonine. Carl T. Liebermann, Berlin, and Fritz Giesel, Brunswick, Germany.

450,890.—Ore crusher. William L. Morris, Cleveland, Chio.

450,930.—Process for removing lime from hides. Wilhelm Dieterle, Feuerbach, Germany.

The lime is neutralized with an "aqueous solution of oxnaphthoic and cresotinic acids."

450,998.—Tanning material. Wilhelm Dieterle, Feuerbach, Germany.

A tanning extract or liquor containing cresotinic acid or its soluble salts.

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450,616.—Method for burning fuel in furnaces. Ellis F. Edgar, Woodbridge, N. J.

450,666.—Machine for welding metals. Herbert E. Fowler, New Haven, Conn.

450,702.—Process of reproducing oil paintings. Louis Mayer, London, Eng.

450,750.—Process of manufacturing hydraulic cement. James B. Speed, Louisville, Ky.

450,756.—Ore washer. William S. Hull and James C. Anderson, Sheffield, Ala.

450,834.—Method of making plates of secondary batteries. Stanley C. C. Currie, Philadelphia, Pa.

The method "consists in fusing the salt or salts of a metal, casting and attaching the fused mass to and between a woven envelope and a core, forming a matrix in said mass by removing the core, and attaching the mass to a support by casting fused metal into the matrix and reducing the cast salt or salts to the metallic state by eliminating the acid radical."

450,840.—Galvanic battery. Charles Willins, Baltimore, Md.

J. F. G.